WHAT IS CLAIMED IS:

1. A lithographic apparatus comprising:

an illumination system that provides a beam of radiation;

a support structure that supports a patterning structure, the patterning structure configured to impart the beam of radiation with a pattern in its cross-section;

a substrate support that supports a substrate;

a projection system that projects the patterned beam onto a target portion of the substrate; and

a debris-mitigation system that mitigates debris particles which are formed during use of at least a part of the lithographic apparatus, wherein the debris-mitigation system is arranged to apply a magnetic field so that at least charged debris particles are mitigated.

2. A lithographic apparatus according to claim 1, wherein the debris-mitigation system comprises a plurality of debris-trapping surfaces.

3. A lithographic apparatus according to claim 2, wherein the debris-mitigation system is further arranged to apply the magnetic field such that, in use, the charged particles are moved substantially towards at least one of the plurality of debris-trapping surfaces.

4. A lithographic apparatus according to claim 1, wherein the debris-mitigation system is further arranged to apply the magnetic field such that, in use, at least some of the charged debris particles spiralize.

5. A lithographic apparatus according to claim 1, wherein the debris-mitigation system comprises at least one solenoid for applying the magnetic field.

6. A lithographic apparatus according to claim 1, wherein the debris-mitigation system is further arranged to switch the magnetic field alternatingly on and off.

7. A lithographic apparatus according to claim 1, wherein the debris-mitigation system is further arranged to apply a gradient to the magnetic field.

8. A lithographic apparatus according to claim 1, wherein the debris-mitigation system is further arranged to apply the magnetic field dynamically with a predetermined frequency.

9. A lithographic apparatus according to claim 1, wherein the debris-mitigation system comprises at least two solenoids which are substantially coaxially aligned, wherein a first one of the at least two solenoids has a diameter which differs from the diameter of a second one of the at least two solenoids.

10. A lithographic apparatus according to claim 1, wherein the debris mitigation system is further arranged to induce, in use, within a group of the debris particles, a current such that at least charged debris particles of that group deflect under influence of a force which has a direction perpendicular to a component of the magnetic field and perpendicular to a component of the electric current induced.

11. A debris-mitigation system for mitigating debris particles within a lithographic apparatus, wherein the debris-mitigation system is arranged to apply a magnetic field so that at least charged debris particles are mitigated.

12. A debris-mitigation system according to claim 11, wherein the debris-mitigation system further comprises a plurality of debris-trapping surfaces.

13. A debris-mitigation system according to claim 12, wherein the debris-mitigation system is further arranged to apply the magnetic field such that, in use, the charged

particles are moved substantially towards at least one of the plurality of debris-trapping surfaces.

14. A debris-mitigation system according to claim 11, wherein the debris-mitigation system comprises at least one solenoid for applying the magnetic field.

15. A debris-mitigation system according to claim 11, wherein the debris-mitigation system is further arranged to switch the magnetic field alternatingly on and off.

16. A debris-mitigation system according to claim 11, wherein the debris-mitigation system is further arranged to apply a gradient to the magnetic field.

17. A debris-mitigation system according to claim 11, wherein the debris-mitigation system is further arranged to apply the magnetic field dynamically with a predetermined frequency.

18. A debris-mitigation system according to claim 11, wherein the debris-mitigation system comprises at least two solenoids which are substantially coaxially aligned, wherein a first one of the at least two solenoids has a diameter which differs from the diameter of a second one of the at least two solenoids.

19. A debris-mitigation system according to claim 11, wherein the debris mitigation system is further arranged to induce, in use, within a group of the debris particles an electric current such that at least charged debris particles of that group deflect under influence of a force which has a direction perpendicular to a component of the magnetic field and perpendicular to a component of the electric current induced.

20. A source for producing EUV radiation, comprising a debris-mitigation system that mitigates debris particles which are formed during production of EUV radiation, wherein the debris-mitigation system is arranged to apply a magnetic field so that at least charged debris particles are mitigated.

21. A source according to claim 20, wherein the debris-mitigation system further comprises a plurality of debris-trapping surfaces.

22. A source according to claim 20, wherein the debris-mitigation system is further arranged to apply the magnetic field such that, in use, the charged particles are moved substantially towards at least one of the plurality of debris-trapping surfaces.

23. A source according to claim 20, wherein the debris-mitigation system comprises at least one solenoid for applying the magnetic field.

24. A source according to claim 20, wherein the debris-mitigation system is further arranged to switch the magnetic field alternatingly on and off.

25. A source according to claim 20, wherein the debris-mitigation system is further arranged to apply a gradient to the magnetic field.

26. A source according to claim 20, wherein the debris-mitigation system is further arranged to apply the magnetic field dynamically with a predetermined frequency.

27. A source for producing EUV radiation according to claim 20, wherein the debris-mitigation system comprises at least two solenoids which are substantially coaxially aligned, wherein a first one of the at least two solenoids has a diameter which differs from the diameter of a second one of the at least two solenoids.

28. A source for producing EUV radiation according to claim 20, wherein the debris mitigation system is further arranged to induce, in use, within a group of the debris particles an electric current such that at least charged debris particles of that group deflect under influence of a force which has a direction perpendicular to a component of the magnetic field and perpendicular to a component of the electric current induced.

29. A method for mitigating debris as produced during use of at least a part of a lithographic apparatus, the method comprising:

applying a magnetic field so that at least charged debris particles are mitigated.

30. A method according to claim 29, wherein the debris-mitigation system further comprises a plurality of debris-trapping surfaces.

31. A method according to claim 30, wherein the magnetic field is applied such that, in use, the charged particles are moved substantially towards at least one of the number of debris-trapping surfaces.

32. A method according to claim 29, wherein the debris-mitigation system comprises at least one solenoid for applying the magnetic field.

33. A method according to claim 29, wherein the magnetic field is alternatingly switched on and off.

34. A method according to claim 29, wherein a gradient is applied to the magnetic field.

35. A method according to claim 29, wherein the magnetic field is applied dynamically with a predetermined frequency.

36. A method according to claim 29, wherein the debris-mitigation system comprises at least two solenoids which are substantially coaxially aligned, wherein a first one of the at least two solenoids has a diameter which differs from the diameter of a second one of the at least two solenoids.

37. A method according to claim 29, wherein within a group of the desired particles an external electric current is induced such that at least charged debris particles deflect under influence of a force which has a direction perpendicular to a component of the magnetic field and perpendicular to a component of the electric current externally induced.

38. A lithographic apparatus comprising:

an EUV radiation generator that produces EUV radiation, wherein charged particle debris is generated as a byproduct of EUV radiation production;

a support structure that supports a patterning structure to be impinged by a beam of said EUV radiation, the patterning structure configured to impart the beam of radiation with a pattern in its cross-section;

a substrate support that supports a substrate;

a projection system that projects the patterned beam onto a target portion of the substrate; and

a magnetic field generator that interacts with said charged debris particles.

39. A lithographic apparatus according to claim 38, wherein the debris-mitigation system further comprises a plurality of debris trapping surfaces, and the magnetic field generator generates a magnetic field that causes the charged debris particles to move towards the plurality of debris trapping surfaces.

40. A lithographic apparatus according to claim 38, wherein the magnetic field generator comprises at least one solenoid.

41. A lithographic method comprising:

generating a beam of EUV radiation, wherein production of said EUV radiation causes generation of charged particle debris as a byproduct;

patterning said beam of EUV radiation;

projecting said patterned beam of EUV radiation onto a substrate; and

generating a magnetic field to interact with said charged debris particles.